

LETTERS TO THE EDITOR

Economic burden of communicable disease outbreak in a military unit

SIR – We report the results of a survey aimed at calculating the economic impact of an outbreak of an unknown communicable disease agent among a British artillery regiment undergoing a field training exercise. The outbreak took place in July 1993 around Hackenberg in the Moselle region of Germany and was of a self limiting nature. The illness, 21 cases centred around a subunit of the regiment, was characterised by sudden onset of vomiting, malaise, and fever. Symptoms subsided with conservative treatment after 24 hours.

Despite extensive investigations and tests we were unable to identify the cause. The epidemic curve, however, was typical of a point source outbreak.

We itemised costs by administering a prepared questionnaire based on a modified version used by two of us (TOJ and VD) to estimate the economic burden of Salmonellosis in the northern Italian region of Emilia. Parts of the questionnaire had been further refined on the basis of the work by Roberts and Sockett¹ and by Harrington.²

The first part of the questionnaire lists all expenses incurred by the casualty on an individual or family basis and resources used by the army as an employer. This enabled us to calculate direct costs (treatment) indirect tangible costs (loss of output), and indirect intangible costs (loss of leisure; grief, pain and suffering). The cost of these last items was estimated by using a "willingness to pay" approach. Casualties of the outbreak were asked what percentage of their gross annual income they would be willing to pay annually to reduce the overall chance of experiencing the same symptoms again by 10%. The second section of the questionnaire lists and itemises outbreak control costs.

After itemisation, all resources were costed using Ministry of Defence capitation and other rates. To estimate the sensitivity of our

results to marginal theory, we abated direct and indirect costs by 20% to estimate their marginal value to the German NHS (direct costs) and to the army (loss of output) as the operational efficiency of the subunit was degraded during the outbreak by 20%. In the second scenario, average costs only were taken into consideration because to the army direct costs represent full additional costs as little use was made of army medical facilities in Germany and loss of output may have been considered 100% as reinforcements had to be brought in.

The low indirect intangible estimate was achieved by repeating the original willingness to pay question on the study population three months after the outbreak had taken place. We thus obtained 0.3% against the original 2.1%.

Outbreak control costs in the low estimate were abated by 50% to estimate their marginal value to the army. Our findings are summarised in the table.

The cost per case in both our estimates is higher than that estimated in UK by Sockett and Roberts for the 1988–89 cases of Salmonellosis (£788). A possible explanation for this finding may be the relative outbreak control expenses due to the field conditions of the setting. The bulk of the direct costs are the expenses of admitting all cases to the Hackenberg hospital, where the accounting system probably reflects a proportion of running costs.

Additionally, the main item of our high costs is represented by the estimate for the cost of pain, grief, and suffering (£381 per case or 33% of total costs in the high estimate.) Although the method we used to estimate this is a new application of the willingness to pay approach, we have no reason to believe that the soldiers we interviewed failed to comprehend the significance of the relative question. The apparent dimming effect of time on soldiers' recollection of discomfort supports our impression.

The advantages of this approach are many. It is a simple and direct expression of personal preference which can be used in resource allocation equations and is currently being developed in other settings, such as road traffic accidents (Jones-Lee, personal communication). Our estimates (2.1% to 0.3% of gross annual income) are based on small numbers of interviewees and the risk decrease was fixed, which did not allow elasticities to be explored. Although indirect intangible costs have long been recognised as a very important part of the costs of disease, very few studies have tried to reach a set of estimates.

We believe that previous estimates of pain,

grief, and suffering used, among others, by us in economic studies of Salmonellosis³ and hepatitis A and B vaccination^{4,5} and based on Department of Transport estimates relating to road traffic accidents are no better than a rough estimate. Repeated studies are required using a willingness to pay approach across a range of conditions in different settings in order to reach credible estimates.

Finally, the Hackenberg outbreak was a relatively "cheap" outbreak as it involved only single men. In a community outbreak, involvement of families and welfare support services in the absence of an extended family would increase the costs considerably.

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- 1 Sockett PN, Roberts JA. The social and economic impact of salmonellosis. A report of a national survey in England and Wales of laboratory-confirmed salmonella infections. *Epidemiol Infect* 1991;107:335–17.
- 2 Harrington W, Krupnick AJ, Spofford WO. *Economics and episodic disease. The benefits of preventing a Giardiasis outbreak.* Washington DC: Resources for the future, 1991.
- 3 Demicheli V, Jefferson TO. Le conseguenze economiche della salmonellosi. *Antibiototerapia per la pratica* 1991;2:73–81.
- 4 Jefferson TO, Demicheli V, Wright DH. An economic evaluation of the introduction of vaccination against hepatitis A in a peace-keeping operation. The case of the United Nations Protection Force in Yugoslavia (UNPROFOR). *International Journal of Technology Assessment in Health Care* 1994 (in press).
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Randomised controlled trials

SIR — The report of the Cochrane lecture in the February journal¹ highlights the sort of substantive and methodological difficulties which are referred to in the editorial of the same edition.² It is very rare to hear anyone involved in public health research of any kind discuss the epistemology of the research methods they use, or the ontological assumptions underlying them. It is quite easy to gain an unwarranted reputation as a methodological bore, if one draws attention to the methodological limitations of the proposed projects of one's colleagues or "flavour of the month" research topics (outcomes for example). In my, admittedly limited, experience among those who work in the field of public health (at least, or perhaps especially among those who have a medical background) the randomised controlled trial (RCT), which Professor McPherson appears to hold in such high esteem, is held as the gold standard to which all research should aspire, and be compared (usually unfavourably).

Public health as a discipline is almost entirely oriented to quantitative research methods, the apotheosis of which is the RCT.

Direct and indirect costs of the outbreak by estimate and item

| | Estimate | | | |
|----------------------------|-----------|--------|-----------|---------|
| | High | | Low | |
| | Value (£) | (%) | Value (£) | (%) |
| Direct costs | | | | |
| Care of cases | 6837 | (28.0) | 5466 | (44.4) |
| Outbreak control cost | | | | |
| Env. health team | 1559 | (6.4) | 744 | (6.0) |
| Unit | 3865 | (16.1) | 1932 | (15.7) |
| Total direct costs | 12 261 | (51.1) | 8142 | (66.2) |
| Indirect tangible costs: | | | | |
| Loss of output | 3725 | 15.5 | 2980 | (24.2) |
| Indirect intangible costs: | | | | |
| 8006 | 33.4 | 1143 | (9.3) | |
| Total indirect costs | 11 731 | 48.9 | 4123 | (33.5) |
| Grand total | 23 982 | 100.0 | 12 265 | (100.0) |
| Cost per case | 1142 | | 584 | |